

CLAIMS

1. High frequency cavity resonator for nuclear magnetic resonance, comprising a set of transmission lines (c) and a shield (e) surrounding these transmission lines, characterized in that each of these
5 transmission lines comprises a straight bar which is divided into elongated cylindrical segments (1), these segments being or being made electrically conducting, the bar being provided with thin dielectric elements (2) inserted between the segments.

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2. Cavity resonator according to claim 1, in which the cylindrical segments (1) are made from a dielectric material whose external surface is made electrically conducting.

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3. Cavity resonator according to any of claims 1 and 2, this cavity being provided with frequency tuning means (4, 6, 7), these tuning means being capable of modifying the thickness of the thin dielectric elements
20 (2).

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4. Cavity resonator according to claim 3, in which the thin dielectric elements (2) are elastically deformable.

5. Cavity resonator according to any of claims 1 to 4, wherein the thin dielectric elements (2) have a substantially circular cross section.

6. Cavity resonator according to any of claims 1 to 5, wherein the dielectric elements (2) have a main surface which is substantially perpendicular to the bar axis.

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7. Cavity resonator according to any of claims 1 to 6, in which the segments (1) and dielectric elements (2) comprise drillings (12, 14), each transmission line also comprising straight dielectric connecting parts 10 (4) that pass through the drillings and on which the segments and dielectric elements can slide.

8. Cavity resonator according to any of claims 1 to 7, wherein the cylindrical segments (1) and 15 dielectric elements (2) of the same bar substantially have the same external diameter.

9. High frequency cavity resonator according to any of claims 1 to 8, in which the transmission lines 20 are substantially parallel and uniformly distributed on a cylindrical surface.

10. High frequency cavity resonator according to any of claims 1 to 9, comprising two ends, one of which 25 is open and the other is closed.

11. High frequency cavity resonator according to any of claims 1 to 10, wherein the shield has a cylindrical structure.

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12. High frequency cavity resonator according to any of claims 10 and 11, in which the shield comprises a re-entrant part (3) on the open end of the cavity resonator.

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13. High frequency cavity resonator according to any of claims 1 to 12, wherein an electrically conductive connection is established between each bar and the shield.

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14. High frequency cavity resonator according to any of claims 1 to 13, which is used in magnetic resonance imaging as a transmitting or receiving system.

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15. High frequency cavity resonator according to any of claims 1 to 14, which is used in the field of Magnetic Resonance Spectroscopy as a transmitting or receiving system.

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16. Nuclear magnetic resonance device comprising a high frequency cavity resonator according to any of claims 1 to 15.

17. A multiple conductor wave guide, constituted of a transmission line which is connected with a set of transmission lines, or elementary conductors, characterized in that these elementary conductors are placed on a cylinder and in that the axes of these elementary conductors are substantially parallel to the cylinder axis, and in that each of these transmission lines, or elementary conductors, comprises a

rectilinear bar which is divided into elongated cylindrical segments (1), these segments being or being made electrically conductive, the bar being provided with thin dielectric elements (2) which are inserted 5 between the segments, the set of elementary conductors being conductively connected with a shield which surrounds this set.